



| Semiconductor Device Type: DC / DB (N7X) 005 SOT-223 Matte Tin  |                   |   | Termination Base Alloy:<br>Copper Alloy (Cu) |                |               | Package Homogeneous Materials:<br>8.1 Electronics (e.g. pc boards, displays) |  |                          | JEDEC 97 Product<br>Marking and/or Pkg.<br>Labeling<br>e3  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|---|-------------------|---|--|----------------|---------------|--|--|--------------------------|--|-------------------|--------------|---------------|-------------------------------------|--------------|------|-----------------------|------------|---------------|--------------|-----------|------|--------------|--|---------------|
| <b>Basic Substance</b>  | <b>CAS Number</b> | <b>Contained in Sub-Component</b>   | <b>% Total Weight</b>                        | <b>mg/part</b> | <b>ppm</b>    | <b>8.71 (mg) Total</b>   | <b>Mold Compound</b>   | <b>% of Total Weight</b> | <b>52.77</b>   |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Silica, vitreous  | 60676-86-0        | Mold Compound   | 44.855                                       | 7.401          | 448,545       | Silica, vitreous   | 60676-86-0   | 85.00                    | <table border="1"> <tr><td>Epoxy Resin</td><td>Trade Secret</td><td>6.13</td></tr> <tr><td>Phenolic Resin</td><td>Trade Secret</td><td>6.13</td></tr> <tr><td>Epoxy, Cresol Novolac</td><td>29690-82-2</td><td>2.45</td></tr> <tr><td>Carbon Black</td><td>1333-86-4</td><td>0.30</td></tr> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table> | Epoxy Resin       | Trade Secret | 6.13          | Phenolic Resin                      | Trade Secret | 6.13 | Epoxy, Cresol Novolac | 29690-82-2 | 2.45          | Carbon Black | 1333-86-4 | 0.30 | <b>Total</b> |  | <b>100.00</b> |
| Epoxy Resin   | Trade Secret      | 6.13  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Phenolic Resin  | Trade Secret      | 6.13  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Epoxy, Cresol Novolac   | 29690-82-2        | 2.45  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Carbon Black  | 1333-86-4         | 0.30  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Epoxy Resin (No bromine, No diantimony trioxide)  | Trade Secret      | Mold Compound   | 3.232  | 0.533          | 32,322        | Epoxy Resin  | Trade Secret   | 6.13                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Phenolic Resin (No Br / CL SbO3, No diantimony trioxide)  | Trade Secret      | Mold Compound   | 3.232  | 0.533          | 32,322        | Phenolic Resin   | Trade Secret   | 6.13                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Epoxy, Cresol Novolac   | 29690-82-2        | Mold Compound   | 1.293  | 0.213          | 12,929        | Epoxy, Cresol Novolac  | 29690-82-2   | 2.45                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Carbon Black  | 1333-86-4         | Mold Compound   | 0.158  | 0.026          | 1,583         | Carbon Black   | 1333-86-4  | 0.30                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Copper  | 7440-50-8         | Lead Frame  | 35.148                                       | 5.799          | 351,482       | <b>Total</b>   |  | <b>100.00</b>            |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Iron  | 7439-89-6         | Lead Frame  | 0.865  | 0.143          | 8,646         | <b>6.07 (mg) Total</b>   | <b>Lead Frame</b>  | <b>% of Total Weight</b> | <b>36.79</b>   |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Silver  | 7440-22-4         | Lead Frame  | 0.701  | 0.116          | 7,008         | Copper   | 7440-50-8  | 95.54                    | <table border="1"> <tr><td>Iron</td><td>7439-89-6</td><td>2.35</td></tr> <tr><td>Silver</td><td>7440-22-4</td><td>1.91</td></tr> <tr><td>Zinc</td><td>7440-66-6</td><td>0.13</td></tr> <tr><td>Phosphorous</td><td>7723-14-0</td><td>0.08</td></tr> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table>   | Iron              | 7439-89-6    | 2.35          | Silver                              | 7440-22-4    | 1.91 | Zinc                  | 7440-66-6  | 0.13          | Phosphorous  | 7723-14-0 | 0.08 | <b>Total</b> |  | <b>100.00</b> |
| Iron  | 7439-89-6         | 2.35  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Silver  | 7440-22-4         | 1.91  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Zinc  | 7440-66-6         | 0.13  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Phosphorous   | 7723-14-0         | 0.08  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Zinc  | 7440-66-6         | Lead Frame  | 0.046  | 0.008          | 460           | Iron   | 7439-89-6  | 2.35                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Phosphorous   | 7723-14-0         | Lead Frame  | 0.030  | 0.005          | 304           | Silver   | 7440-22-4  | 1.91                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Silver (Ag)   | 7440-22-4         | Die Attach  | 0.667  | 0.110          | 6,673         | Zinc   | 7440-66-6  | 0.13                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Proprietary Resin   | Trade Secret      | Die Attach  | 0.157  | 0.026          | 1,573         | Phosphorous  | 7723-14-0  | 0.08                     |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Proprietary Curing agent & Hardener   | Trade Secret      | Die Attach  | 0.026  | 0.004          | 255           | <b>Total</b>   |  | <b>100.00</b>            |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Silicon   | 7440-21-3         | Chip (Die)  | 1.030  | 0.170          | 10,300        | <b>0.14 (mg) Total</b>   | <b>Die Attach</b>  | <b>% of Total Weight</b> | <b>0.85</b>  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Gold  | 7440-57-5         | Wire Bond   | 0.550  | 0.091          | 5,500         | Silver (Ag)  | 7440-22-4  | 78.50                    | <table border="1"> <tr><td>Proprietary Resin</td><td>Trade Secret</td><td>18.50</td></tr> <tr><td>Proprietary Curing agent &amp; Hardener</td><td>Trade Secret</td><td>3.00</td></tr> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table>   | Proprietary Resin | Trade Secret | 18.50         | Proprietary Curing agent & Hardener | Trade Secret | 3.00 | <b>Total</b>          |            | <b>100.00</b> |              |           |      |              |  |               |
| Proprietary Resin   | Trade Secret      | 18.50   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Proprietary Curing agent & Hardener   | Trade Secret      | 3.00  |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Tin   | 7440-31-5         | Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour | 8.010  | 1.322          | 80,100        | Proprietary Resin  | Trade Secret   | 18.50                    |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   | <b>TOTALS:</b>                               | <b>100.000</b> | <b>16.500</b> | <b>1,000.000</b>   |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>0.0165 g Total Mass</b>  |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| This semiconductor device and its homogenous materials comply with EU Directives: 2002/95/EC (27 January 2003) & Directive 2011/65/EU (08 June 2011) and 2015/863/EU (31 March 2015) and 2002/53/EC (End-of-Life Vehicles (ELV) without exemption (zero)  |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.  |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.   |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL IQTM family of databases to obtain a test report at <a href="http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/">http://ul.com/global/eng/pages/offerings/industries/chemicals/plastics/</a>  |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.   |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
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| Assembled package referenced above is EU REACH compliant based on the latest SVHC candidate list of ECHA which can be found at <a href="http://echa.europa.eu/web/guest/candidate-list-table">http://echa.europa.eu/web/guest/candidate-list-table</a>  |                   |   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>0.17 Total (mg)</b>   | <b>Chip (Die)</b>  | <b>% of Total Weight</b> | <b>1.03</b>  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | Doped Silicon  | 7440-21-3  | 100.00                   | <table border="1"> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table>  | <b>Total</b>      |              | <b>100.00</b> |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>Total</b>   |  | <b>100.00</b>            |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>0.09 (mg) Total</b>   | <b>Wire Bond</b>   | <b>% of Total Weight</b> | <b>0.55</b>  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | Doped Gold   | 7440-57-5  | 100.00                   | <table border="1"> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table>  | <b>Total</b>      |              | <b>100.00</b> |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>Total</b>   |  | <b>100.00</b>            |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>1.32 (mg) Total</b>   | <b>Plating on external leads (pins) - Matte Tin / annealed at 150°C for 1 hour</b> | <b>% of Total Weight</b> | <b>8.01</b>  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | Tin  | 7440-31-5  | 100.00                   | <table border="1"> <tr><td><b>Total</b></td><td></td><td><b>100.00</b></td></tr> </table>  | <b>Total</b>      |              | <b>100.00</b> |                                     |              |      |                       |            |               |              |           |      |              |  |               |
| <b>Total</b>  |                   | <b>100.00</b>   |  |                |               |  |  |                          |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>Total</b>   |  | <b>100.00</b>            |  |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |
|   |                   |   |  |                |               | <b>16.500</b>  |  |                          | <b>100.000</b>   |                   |              |               |                                     |              |      |                       |            |               |              |           |      |              |  |               |